

S. M. YAHYA, *Fundamentals of Compressible Flow*.
Wiley, New York, 1982, 352 pp., £9.00.

As implied by the title, this book is aimed at undergraduate engineering students taking a first course in gas dynamics. The author is Professor of Thermal Engineering at the Indian Institute of Technology, Delhi, and has extensive teaching and research experience in fluid dynamics, turbo-machinery and power plant engineering.

The book itself consists of eleven chapters, divided into two parts. There are eight appendices, a bibliography and an index.

Part I contains nine chapters. The first chapter covers definitions and basic relationships. Subsequent chapters describe in detail the steady-state and transient one-dimensional equations for continuity, momentum, moment of momentum, energy and entropy. The following chapters deal with isentropic flow with variable area, wave motion, flow with normal and oblique shock waves, and flow in constant area ducts with friction or heat transfer.

In Part II, the momentum equations derived in Part I are expanded to the multi-dimensional case in Cartesian and cylindrical coordinates to give the Navier-Stokes equations. The potential and stream functions are introduced. The final chapter gives a good account of some of the experimental measurement techniques used. These range from the simple pitot tube to hot-wire anemometry and supersonic wind tunnels.

Many clear diagrams and charts are interspersed throughout the body of the text, and each chapter is concluded with worked and unworked problems.

The appendices include some difficult integrals, and also some extremely useful extracts from shock and gas tables.

The book is written with the assumption of very little initial knowledge of the subject, beyond 'A' level maths and physics, and as such should prove a useful university textbook.

J. C. LUDWIG
CHAM Ltd.
Bakery House
40 High Street
London SW19, U.K.

Selected Publications of Wilhelm Nusselt and Ernst Schmidt. Edited by U. GRIGULL (Technische Universität München, West Germany), Hemisphere, Washington, DC, 1983, 262 pp., ISBN 0-89116-329-8, list price \$11.95.

IT WOULD be too ambitious to review any, let alone all, the papers presented in this volume of Selected Publications in any detail. The authors have a too well-established reputation for the reviewer to dare to undertake such a task. The volume is

divided into two sections, each containing 12 papers by Wilhelm Nusselt and Ernst Schmidt, respectively. Each section is preceded by a Biographical Note and a full Bibliography of the author's publications.

There is a wealth of classical papers which have been quoted and requoted frequently. The reviewer, having himself taken a particular interest in the past in Nusselt's renowned paper on condensation, which on its own would have been worthy to establish Nusselt's well-deserved reputation, has come to the conclusion that many authors who quote the paper have read its message at best second-hand. And there is the outstanding paper on the Fundamental Law of Heat Transfer which has transformed the study of forced and free convection worldwide.

Schmidt possessed not only an excellent grasp of theory, but he excelled in devising optical and electrical methods for experimental work, many of which are still in use today.

Many of the papers even today still deserve careful study. For most English-speaking readers this presents a formidable task not made any easier by the volume of Selected Publications. Apart from the Biographical Notes, the titles of the selected papers, and one solitary paper by Schmidt originally written in English, all papers are simply photographic reprints of the original German texts. This on the face of it should not be an insurmountable obstacle. But first, the printing quality of many of the original papers was very poor. Secondly, the style, particularly of some of the early papers, is somewhat archaic and therefore difficult for the non-German. Thirdly, many of the symbols used are, if not inconsistent, then at least unfamiliar to present-day readers, and they are undefined except in the course of the text. Fourthly, the units used, although 'metric', follow the obsolete metric-technical-caloric usage or even more unfamiliar practices. None of all this is the fault of Nusselt or Schmidt: for example poor printing is the consequence of the economic situation in Germany during and after the First World War and backward scientific printing facilities early this century.

Would it have been preferable to translate the papers into modern English, into modern technical concepts and idiom, into a unified clearly defined nomenclature, and finally into SI units? (e.g. should "The velocity during condensation obviously would be destroyed and converted into heat..." be translated into "The kinetic energy during condensation would be dissipated and transformed into internal energy..."). The effort required and cost involved would have been tremendous. The collection would have been inaccessible due to excessive price: is it any more accessible to the English-speaking reader in its present form?

Y. R. MAYHEW
Department of Mechanical Engineering
University of Bristol
Queen's Building
University Walk
Bristol BS8 1TR, U.K.